REMARKS/ARGUMENTS

This letter is responsive to the Office Action dated **September 24, 2004**. Under separate sheet of cover, applicant encloses a request for a three-month extension of time.

Amendments to the Specification

Applicant has amended paragraphs 36-38 to correct some typographical errors. No new matter has been added.

Additional text has been added to the penultimate sentence of paragraph 39, and a new paragraph 44 has been added at the end of the description. This new text is simply intended to clarify the relationship between terminology in the claims and the description and to avoid any ambiguity, without adding new matter. Thus, it is now stated that the gas inlet 270 is in fluid communication with an external reference gas source (not shown) with a known reference pressure, and the interior of the gas dome 450 and the recess 260 form a second chamber, whose internal reference gas pressure is applied to the diaphragm 180. Furthermore, the pressure regulator body 330 provides a first housing, while the pressure controller body 200 at least partially defines the second chamber and provides the second housing. Additionally, the upper part of the pressure controller body 200 forms another chamber.

Amendments to the Claims

Overview

New Claim 13 is substantially derived from Claim 1 as originally filed and includes a new feature (e) calling for the inclusion of a reference inlet and a reference outlet, for a reference fluid, in the second housing. Additionally, it is specified that a control valve means is provided in the second housing, connected to both the reference inlet and the reference outlet, for controlling the pressure in at least part of the second housing applied to the flexible diaphragm and the back pressure member.

In addition to new Claim 13, new Claims 14-27 are being introduced. These claims are fairly based on the application as originally filed. However, as these claims have no direct counterparts in the original claims, these claims are first reviewed in detail with reference to the disclosure as originally filed, to indicate support and antecedents for the features introduced.

Generally, these features are concerned with details of the valve arrangement for controlling the pressure of the second chamber or housing, as shown in detail in

Figures 5a and 5b, and in general the description in paragraphs 36, 37, 38, and 39 is applicable.

Claim 13

Element (a) defines the inlet and outlet of the first chamber as a "fluid inlet" and a "fluid outlet". In element (d), it is specified that the back pressure member is "for controlling fluid flow between the fluid inlet and the fluid outlet".

Claim 13 introduces a feature of a reference inlet for a reference fluid, as shown at 270 in Figures 2a, 5a, 5b and elsewhere. Feature (e) of claim 1 also introduces a reference outlet, which is clearly mentioned in the first three lines of paragraph 38, which additionally makes it clear that this feature is necessarily not shown in Figure 2a. This feature (e) also includes a control valve means in the second housing for controlling the pressure in at least part of the second housing. By way of example only, this valve means corresponds to gas inlet valve 440 and the gas outlet valve 460, which, as detailed in paragraphs 38 and 39, control the gas pressure within a gas dome 450, which in turn controls the pressure applied to the diaphragm 180.

Claim 14

Claim 14 introduces the feature of at least one pressure controlling device connected to the control valve means. This is directed to the pressure controlling devices 280, mentioned in paragraph 38 and shown in Figure 2a at least.

Claim 15

Claim 15 introduces a feature of a processor, as shown at 400 in Figure 2a.

Claim 16

This claim introduces the feature of a pressure transducer, for measuring pressure downstream of the outlet to the first fluid, and connected to the processor, to provide feedback on the downstream pressure. Such a transducer is shown at 420 in Figure 2a.

Claim 17

Claim 17 specifies that the control valve means comprises a reference inlet valve for controlling flow of the reference fluid into the second chamber and connected to the reference inlet, and a reference outlet valve connected to the reference outlet for controlling the flow of the reference fluid out of the second chamber. Paragraph 37 details the arrangement of the gas inlet valve 440, and it is noted at the beginning of paragraph 38 that a similar arrangement is provided for the gas outlet valve 460. The arrow in Figure 2a indicate schematically the flow of

the reference gas from the inlet 270 through the gas inlet valve 440 into the interior of the gas dome 450, and then through the gas outlet valve 460 to the gas outlet.

Claim 18

Claim 18 introduces a feature of a separate member in which the reference inlet and outlet valves are mounted, and the gas dome 450 provides this member, as is detailed further in claim 19.

Claim 20

Claim 20 specifies the configuration of the second housing, where there is an end wall separating the second chamber from another chamber at the top of the second housing, with the first and second valves being located in the other chamber. This is clearly shown in Figure 2a. As detailed above, the description has been amended to avoid any ambiguity in correspondence between first and second housings and the pressure regulator body 330 and the pressure control body 200.

Claim 21

This introduces the feature that the end wall includes a through hole, as shown at 215 in Figure 2a, and wherein the gas dome 450 is mounted on the end wall, again clearly shown and described in respective Figure 2a.

Claim 22

This claim details the specific flow connections, indicated schematically by the arrow in Figure 2a, between the reference gas inlet 270 through to the reference outlet. This arrangement of holes is shown in Figures 5a and 5b, and described, at least with respect to the gas inlet valve 440. Thus, the flange portion 451 is described, in paragraph 37 as including a plurality of holes. Some of these holes communicate fluidly with the through holes 216 in the end wall 214. This arrangement provides communication between the reference gas inlet 270 and the gas inlet valve 440. It is also specified in paragraph 37, that others of these holes provide communication between the outlet of gas inlet valve 440 and the interior of the gas dome 450.

Then, in paragraph 38, it is specified that the arrangement for the gas outlet valve 460 generally correspond. Thus, a flow path is provided through to the gas dome 450 to the gas outlet valve 460, and then, through the flange portion 451 and holes in the end wall 214 to a reference gas outlet.

Claim 23

This claim simply specifies that the dome comprises a cylindrical portion, as shown in Figure 2a and elsewhere, and as mentioned in paragraph 37.

Claims 24-27

New Claims 24-27 are substantially derived from withdrawn Claims 2, 4, 5 and 6, respectively.

Anticipation under 35 USC 102(b)

In paragraph 2 of the Office Action, the Examiner rejects Claims 1 and 3-12 as being anticipated by Griswold (US Patent No. 3,336,843). The Examiner provides a detailed analysis in comparison of Griswold with the features of Claims 1 and 3-12. As detailed above, applicants are no longer relying upon the detailed features of any of these claims to distinguish the claimed invention from this reference and other known art. Accordingly, no detailed review or response is made to the arguments set out by the Examiner.

Griswold provides a relatively simple technique for controlling the back pressure in a valve 10. Specifically, a valve spring 49 acts in a direction to hold disk 19 against the sealing surface 18. The valve spring 49 provides a source of static pressure in the chamber 44. Additionally, a control pipe 43 is connected to a valve (not shown) for controlling admission and escape of fluid from chamber 44 by way of a single port 45. Pressure in the valve outlet chamber 15 acts on the undersurface of the flexible diaphragm 27, and pressure in the chamber 44 acts on the upper surface of the diaphragm. If the pressure in the valve outlet chamber 15 is too high, then the valve (not shown) can be adjusted to exhaust fluid from the chamber 44 through port 45. If the pressure in the valve outlet chamber 15 is too low, then the valve (not shown) can be adjusted to admit fluid through the port 45 and into the chamber 44. In such an arrangement, control over the valve is relatively crude and in particular is not in any way dynamic or capable of rapid response. How quickly this pressure, within the actual valve itself can be changed, will depend upon a number of factors, including nature of the fluid, e.g., gas or liquid, volume of control lines and the like.

In contrast, new Claim 13 provides for the inclusion of a reference inlet and a reference outlet, for a reference fluid, in the second housing. Additionally, it is specified that a separate control valve means is provided within the back pressure valve itself. Thus, the intention is that a source of a reference control fluid be provided to the valve. This can be provided at a relatively constant pressure. The control valve means within the back pressure valve itself, is then able to control exactly what back pressure is exerted on the diaphragm by adjusting the flow rate of the reference fluid through the chamber 44. This can be done in a dynamic and rapid fashion. Thus, as detailed in Figure 2a, a flow

path is defined by the inlet 270, the control valve means, and the outlet, so as in effect, to control the pressure within the second chamber.

Accordingly, applicant submits that Griswold neither anticipates Claim 13 nor renders Claim 13 obvious. Claims 14-27 depend from Claim 13, and are allowable for at least the reasons given for Claim 13, and for introducing additional patentable features.

For the reasons above, the Applicants submit that the claims are in condition for allowance.

Respectfully submitted,

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Encl.